

PROTOZOAN INQUILINES FROM REPTILES. II. MONOCERCOMONAS TANTILLORUM N. SP. FROM THE FLORIDA CROWNED SNAKE, TANTILLA CORONATA BAIRD AND GIRARD.

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The Florida variety of the crowned snake, *Tantilla coronata* Baird and Girard, is restricted to scrub, sandhills and mesic hammock (Laessle, 1958) as a fossorial species, feeding presumably on small invertebrates (Telford, 1961).

An examination of eight specimens of this snake for protozoan inquilines yielded negative results except in one specimen which had in its fresh feces about two dozen tetramastigote zooflagellates, small and active, of the genus *Monocercomonas*. These flagellates differed in size and certain details of morphology from either of the other two species inquiline in saurians, *Monocercomonas colubrorum* Hammerschmidt (1844) and *M. neosepsorum* Bovee and Telford (1962), and it differed also from the small *Monocercomonas* spp. in arthropod invertebrates (Bernstein, 1928; Kirby, 1931; MacKinnon, 1912; Travis and Becker, 1931).

MATERIALS AND METHODS

Cloacal and gut contents from eight specimens of the crowned snake, *Tantilla coronata*, were obtained, cultured, prepared and studied by methods previously discussed (Bovee and Telford, 1962). The fresh feces from one snake captured in Polk County, Florida, contained a number of monocercomonad flagellates which swam actively in Trager's (1934) solution. These were studied in detail.

OBSERVATIONS AND RESULTS

*Morphology of the Protozoan: Size and Shape:* The body is spindle-shaped, 10-12  $\mu$ , averaging 11  $\mu$  long to the tip of the axostyle, and averaging 5.75  $\mu$  wide at the widest part of the body, midway of its length. (Fig. 1) The body at that point is nearly

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oval in cross section (Fig. 3), and it is twisted about one and one-third turns around the axostyle within the length of the body. This torsion is shown principally by the presence of a shallow spiral groove which marks the twist of the body.

*The Flagella:* These four organelles arise from a complex of kinetosomes (a mastigont) at the anterior end, three of them beating freely. The fourth is a recurrent flagellum usually lying against the body, trailing behind the posterior tip of the axostyle. It is not firmly adherent to the body surface, and sometimes may beat freely, but ordinarily does not.

The flagella are very slender, the tips being too fine to resolve clearly, so that the exact lengths could not be determined. The three anterior flagella are approximately the same length as the body, about 10-12  $\mu$ ; and they are about 0.4  $\mu$  diameter at their bases, tapering to unresolvable slenderness at their tips. The trailing flagellum is heavier, about 0.6  $\mu$  at its base, and also tapering to an unresolvable tip. It is at least one and two-thirds times as long as the body, about 19-21  $\mu$  long. (Figs. 1, 2).

*Parabasal Apparatus:* The parabasal body (kinetoplast) is a small ovate structure about 0.5  $\mu$  long, attached to the kinetosomal complex, and usually rests against the nucleus. It can be discerned only in the fixed organism. No cresta, costa, pelta, nor undulating membrane is present.

*Axostyle:* The capitulum of the axostyle is a very slightly broadened structure, rounded at the anterior end. It does not partially embrace the nucleus as does the capitulum of *M. colubrorum* (Grassé, 1953). The capitulum is about 0.8  $\mu$  broad, and about 2.5  $\mu$  long. At the rear end of the capitulum the axostyle shaft is about 0.6  $\mu$  diameter, tapering to a pointed tip at the rear end. The entire axostyle is 9.5-11.5  $\mu$  long. (Fig. 1).

*The Nucleus:* This internal organelle is of broad oval shape, nearly spherical, 2.8  $\mu$  x 3.2  $\mu$  in dimensions. It is clear and vesicular in the living specimens, and is homogeneously stained both by acid methyl-green and nuclear hematoxylin (Melander and Wingstrang, 1943). It is located adjacent to the capitulum of the axostyle near the anterior end of the body (Fig. 1).

*Other Inclusions:* Fifteen to 20 crystalline and refractile granules 0.3-1.2  $\mu$  in size are clustered near the axostyle and nucleus, particularly in the anterior one-third of the body length. Some

of the larger granules seem attached to the inner surface of the cell membrane just to the rear of the nucleus. Numerous other very tiny granules, too small to be clearly resolved, are also present, distributed generally throughout the cytoplasm.

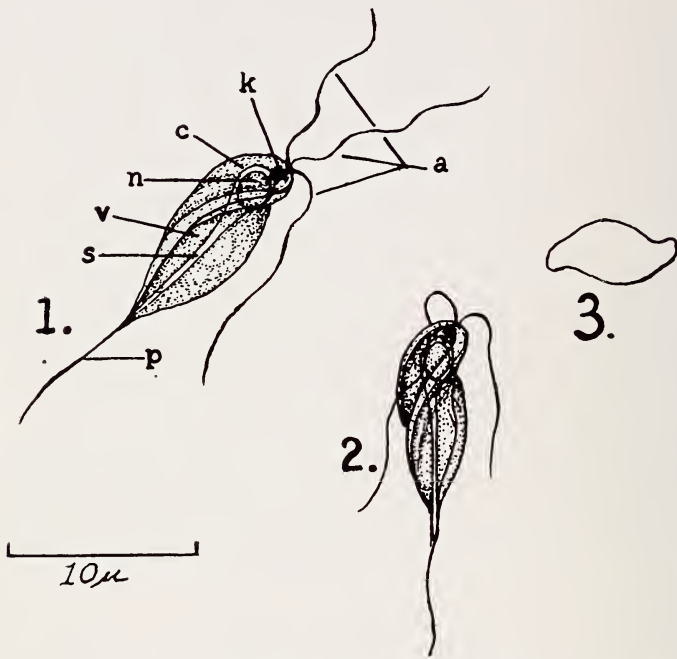


Fig. 1. *a.* Anterior swimming flagella. *p.* Posterior trailing flagellum. *k.* Kinetosomal complex. *n.* Nucleus. *c.* Capitulum of axostyle. *s.* Shaft of axostyle. *v.* Vacuole-like structure present in some individuals.

Fig. 2. Another specimen of *Monocercomonas tantillorum* n. sp.

Fig. 3. Cross-section through the body at *v.*, Fig. 1.

### DISCUSSION

The systematic placement of the genus *Monocercomonas*, and its synonymies, have already been discussed (Bovee and Telford, 1962). *Monocercomonas tantillorum* n. sp. differs from other species by its host, and its relatively thick body, the other species being much more flattened. It has less torsion of the body than does *M. colubrorum* and *M. neosepsorum*; it is smaller than *M. colubrorum*; and while about the same length as *M. neosepsorum*, it is thicker and broader than that species.

*Diagnosis:* *Monocercomonas tantillorum* n. sp., inquilinic in the intestinal tract of the Florida variety of the crowned snake, *Tantilla coronata* Baird and Girard. Length 10-12  $\mu$ ; greatest breadth, 5-6  $\mu$ . Shape, a twisted spindle, body ovate in cross-section, torsion about one and one-third turns about the axostyle, clockwise. Four flagella, 3 anterior, 10-12  $\mu$  long, 0.4  $\mu$  diameter at bases tapering to less than 0.2  $\mu$  at tips; one trailing flagellum, adjacent, not attached to, the body, 10-21  $\mu$  long, 0.6  $\mu$  diameter at the base, tapering to less than 0.2  $\mu$  at tip. Kinetosomes of flagella form a mastigont. Parabasal body small, oval, 0.5  $\mu$  long, attached to mastigont. Axostyle single, central, with ovate capitulum 0.8  $\mu$  x 2.5  $\mu$ , shaft straight, 0.6  $\mu$  diameter, 9.5-11.5  $\mu$  long, tapering to pointed posterior tip. Nucleus broadly ovate, 2.8 x 3.2  $\mu$  diameters, adjacent to axostylar capitulum, vesicular, without endosome. Cytoplasm with small granules, no vacuoles; several refractile granules 0.3-1.2  $\mu$ , adjacent to cell membrane near nucleus. No cresta, costa, pelta nor undulating membrane. From snake in Polk County, Florida.

#### SUMMARY

1. *Monocercomonas tantillorum* n. sp. a trichomonad flagellated protozoan inquilinic in the Florida crowned snake, *Tantilla coronata* Baird and Girard, is described and depicted.

2. It differs from other species of *Monocercomonas* in being smaller than most, and proportionately thicker, with less torsion of the body than other species.

3. Its host is an endemic species in Florida, restricted in habitat and diet, and presumably likely to have developed its own specialized inquilines.

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